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10/811,993	03/30/2004	Tae-Sun Kim	2557-000196/US	2678

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EXAMINER

TRAN, TRANG U

ART UNIT	PAPER NUMBER
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2622

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/811,993

Applicant(s)

KIM ET AL.

Examiner

Trang U. Tran

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 24-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6,8-21 and 23 is/are rejected.
- 7) ☒ Claim(s) 5,7 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/30/04; 2/2/05; 8/5/05; 3/8/07.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species I, claims 1-23 in the reply filed on April 25, 2007 is acknowledged. The traversal is on the ground(s) that claim 1 is generic to all of Species, that the Examiner would not be unduly burdened if forced to examiner Species I-IV, and that Election of Species Requirement is improper because Figs. 6 and 8 are subcomponents of the larger conversion apparatus of Fig. 1 but not species. This is not found persuasive because it is a serious burden on the Examiner if a restriction is not required because the search for at least different species Figs. 3-9 is a serious burden on the Examiner. It is agreed that claim 1 is generic to Species I-IV. After reconsideration, it is found that there are four Species disclosed in this specification: Species I : Figs. 3 and 4A-4F, Species II: Fig. 5, Species III: Figs. 6 and 7A-7O, and Species IV: Figs. 8-9P.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 24-31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected claims, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on April 25, 2007.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 6, 8-21 and 23 are rejected under 35 U.S.C. 102(b) as being anticipate by Kim (US Patent No. 5,943,099).

In considering claim 1, Kim discloses all the claimed subject matter, note 1) the claimed receiving a control command to perform one of at least two interlaced-to-progressive conversion (IPC) techniques on input interlaced scan data is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 3, line 48 to col. 4, line 21), and 2) the claimed performing the IPC technique instructed by the received control command on the input interlaced scan data is met by the selector 140 which selects a signal Is output based on basis of the compared results as an interpolated signal Vout (Fig. 1, col. 3, line 48 to col. 4, line 21 and col. 6, line 50 to col. 7, line 32).

In considering claim 2, the claimed wherein the control command indicates to perform one of at least a spatial interpolation IPC technique and a spatial/temporal interpolation IPC technique is met by the selector 140 which selects a signal Is output based on basis of the compared results as an interpolated signal Vout (Fig. 1, col. 3, line 48 to col. 4, line 21 and col. 6, line 50 to col. 7, line 32).

In considering claim 3, Kim discloses all the claimed subject matter, note 1) the claimed wherein the spatial interpolation IPC technique performs spatial interpolation on a current field of the input interlaced scan data to produce a field of complementary scan data that together with the current field represents a frame of progressive scan data is met by the spatial interpolator 110 which is simple line doubling (Fig. 1, col. 1,

line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21), and 2) the claimed the spatial/temporal interpolation IPC technique performs directionally adaptive spatial interpolation selectively combined with temporal interpolation using the current field, at least one previous field and at least one subsequent field of the input interlaced scan data to produce a field of complementary scan data that together with the current field represents a frame of progressive scan data is met by the temporal interpolator 120 which is edge direction (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 4, the claimed wherein the spatial/temporal interpolation IPC technique is adaptive is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 6, the claimed wherein the control command indicates to perform one of at least a spatial interpolation IPC technique, an alternative field output IPC technique in which two consecutive fields of the input interlaced scan data are alternately output on a scan line by scan line basis to produce a frame of progressive scan data, and a spatial/temporal interpolation IPC technique is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

Claim 8 is rejected for the same reason as discussed in claim 1.

Claim 9 is rejected for the same reason as discussed in claim 2.

Claims 10-11 are rejected for the same reason as discussed in claims 3-4, respectively.

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Claim 12 is rejected for the same reason as discussed in claim 6.

In considering claim 13, the claimed wherein the conversion structure comprises: an interpolator configured to interpolate lines of a frame of progressive scan data missing from a current field of the input interlaced scan data by spatially interpolating the missing lines using the current field is met by the spatial interpolator 110 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 14, the claimed wherein the conversion structure is configured to supply the selector with the input interlaced scan data of a current field and one of a preceding and following field of the input interlaced scan data is met by the selector 140 which selects a signal Is output based on basis of the compared results as an interpolated signal Vout (Fig. 1, col. 3, line 48 to col. 4, line 21 and col. 6, line 50 to col. 7, line 32).

In considering claim 15, the claimed wherein the conversion structure comprises: a spatial/temporal interpolator configured to perform a spatial/temporal interpolation IPC conversion technique on the input interlaced scan data to produce a portion of the progressive scan data is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 16, the claimed wherein the spatial/temporal interpolator is configured to perform adaptive spatial/temporal interpolation is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 17, the claimed wherein the spatial/temporal interpolator is configured to perform directionally adaptive spatial interpolation is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 18, the claimed wherein the spatial/temporal interpolator is configured to directionally adapt the spatial interpolation based on a measure of a difference between pixels neighboring a pixel being interpolated is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 19, the claimed wherein the spatial/temporal interpolator is configured to adapt the spatial/temporal interpolation based on a complexity of an image is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 20, the claimed wherein the spatial/temporal interpolator is configured to adapt the spatial/temporal interpolation to reduce an influence of the temporal interpolation as a change in an image over time increases is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

Claim 21 is rejected for the same reason as discussed in claim 3 and further the claimed the selector is configured to receive output of the interpolator, and output of the spatial/temporal interpolator.

Claim 23 is rejected for the same reason as discussed in claim 7.

Allowable Subject Matter

5. Claims 5, 7 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Shin et al (US Patent No. 6,614,485 B2) disclose deinterlacing apparatus.

Wagner et al. (US Patent No. 6,452,639 B1) disclose raster scan conversion system for interpolating interlaced signals.

Ledinh et al (US Patent No. 5,936,676) disclose apparatus and method for line interpolating an interlaced video signal.

Kovacevic et al. (US Patent No. 5,661,525) disclose method and apparatus for converting an interlaced video frame sequence into a progressive-scanned sequence.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trang U. Tran whose telephone number is (571) 272-7358. The examiner can normally be reached on 8:00 AM - 5:30 PM, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

June 20, 2007



Trang U. Tran
Primary Examiner
Art Unit 2622
TRANG U. TRAN
PRIMARY PATENT EXAMINER